UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,991	07/31/2003	Xiaodong Wang	02007 (16792)	2202

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Benjamin Lee	WANG, TED M

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/631,991	WANG, XIAODONG
	Examiner	Art Unit	
	Ted M. Wang	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 February 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,3,9,13-15,18 and 19</u> is/are rejected.

7)☒ Claim(s) <u>2,4-8,10-12,16,17 and 20-22</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>02 December 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date <u>11/5/2003</u>.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment

1.   The preliminary amendment filed on 02/20/2004 has been entered.

Claim Objections

2.   Claims 21 and 22 are objected to because of the following informalities:

❑   In claims 21 and 22, lines 7, 10, and 12, change "(b)(1)" to --- (b1) ---, "(b)(2)" to

--- (b2) --- and "(b)(3)" to --- (b3) ---, respectively.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed
publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4.   Claims 1, 3, 9, 13-15, 18 and 19 are rejected under 35 U.S.C. 102(a) as being

anticipated by Yang et al. (A sequential Monte Carlo blind receiver for OFDM systems in

frequency-selective fading channels. IEEE Trans. Sig. Proc., 50(2):271-280, February

2002.)

❑   With regard claim 1, Yang et al. teaches a method for demodulating data from a

channel (Abstract and page 271, right column, lines 16-22), comprising:

      receiving a priori probability values for symbols transmitted across the

channel (Fig.3, Fig.5 element SMC detector input from symbol prob computer,

page 276, section V, lines 1-17);

      in accordance with the a priori probability values, determining a set of

Monte Carlo samples of the symbols weighted with respect to a probability

distribution of the symbols (Fig.3 and 5, page 274, left column, lines 4-7, page

276, section V, lines 1-17 and page 277, left column, lines 4-7); and

      estimating a posteriori probability values for the symbols based on the set

of Monte Carlo samples (Fig.3, Fig.5 element bit LLR computer, page 276,

section V, lines 1-17, page 277, left column, line 8 – right column, before section

VI).

- With regard claim 3, Yang et al. further teaches wherein the Monte Carlo
  samples comprise stochastic Monte Carlo samples (page 276, section V, lines 3-
  4).

- With regard claim 9, Yang et al. further teaches based on the a posteriori
  probability values, calculating a posteriori log-likelihood ratios of interleaved code
  bits (page 277, left column, line 8 –12).

- With regard claim 13, which is a program storage device tangibly embodying a
  program of instructions executable by a computer machine to program a method
  related to claim 1, all limitation is contained in claim 1. The explanation of all the
  limitation is already addressed in the above paragraph. Where Yang et al.
  teaches that the SMC detector as shown in Fig.5 implements the algorithm

described in section IV-A (page 278, left column, lines 14-15) and executes by a computer (page 277, right column section VI, lines 1-4) for simulation. It is inherent that the algorithm (A computable set of steps to achieve a desired result) is been stored in a program storage device and been executed in a computer.

❑ With regard claim 14, which is a demodulator mean plus function related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

❑ With regard claim 15, which is a demodulator mean plus function related to claim 3, all limitation is contained in claim 3. The explanation of all the limitation is already addressed in the above paragraph.

❑ With regard claim 18, which is a receiver claim related to claim 1, Yang et al. further teaches

a soft outer channel decoder (Fig.5 element channel decoder, page 276, section V, lines 14-17);

a soft inner demodulator (Fig.5 element SMC detector and page 278, right column, lines 12-14); and

a symbol probability computer (Fig.5 element symbol prob computer).

All other limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

❏ With regard claim 19, which is a receiver claim related to claim 9, all limitation is

contained in claim 9. The explanation of all the limitation is already addressed in

the above paragraph.

Double Patenting

5.   The nonstatutory double patenting rejection is based on a judicially created
doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the
unjustified or improper timewise extension of the "right to exclude" granted by a patent
and to prevent possible harassment by multiple assignees.   A nonstatutory
obviousness-type double patenting rejection is appropriate where the conflicting claims
are not identical, but at least one examined application claim is not patentably distinct
from the reference claim(s) because the examined application claim is either anticipated
by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140
F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29
USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir.
1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422
F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163
USPQ 644 (CCPA 1969).
       A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d)
may be used to overcome an actual or provisional rejection based on a nonstatutory
double patenting ground provided the conflicting application or patent either is shown to
be commonly owned with this application, or claims an invention made as a result of
activities undertaken within the scope of a joint research agreement.
       Effective January 1, 1994, a registered attorney or agent of record may sign a
terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with
37 CFR 3.73(b).

6.   Claims 1, 13 and 14 are provisionally rejected on the ground of nonstatutory

obviousness-type double patenting as being unpatentable over claims 1 and 1 of

copending Application No. 11/063,633. Although the conflicting claims are not identical,

they are not patentably distinct from each other because the broader application claim

would have been obvious in view of the narrower issued claim.

❏ Claim 1 of copending application No. 11/063,633 recites the limitations—

A method for demodulating data from a channel, comprising:

(a) "receiving a priori probability values for symbols transmitted across the channel,"

(b) "each symbol decomposable into a first symbol component and a second symbol component;"

(c) "in accordance with the a priori probability values, determining a first set of Monte Carlo samples of the first symbol components weighted with respect to a probability distribution of the first symbol components" and

(d) "determining a second set of Monte Carlo samples of the second symbol components weighted with respect to a probability distribution of the second symbol components, where the first symbol components and the second symbol components are sampled independently;" and

(e) "estimating a posteriori probability values for the symbols based on the first and second sets of Monte Carlo samples."

On the other hand, claim 15 of the instant application recites the limitations –

A method for demodulating data from a channel, comprising:

(a) "receiving a priori probability values for symbols transmitted across the channel;"

(c) "in accordance with the a priori probability values, determining a set of Monte Carlo samples of the symbols weighted with respect to a probability distribution of the symbols;" and

(e) "<u>estimating a posteriori probability values for the symbols based on the</u> <u>set of Monte Carlo samples.</u>"

The claim 1 of copending application No. 11/063,633 as recited in the above paragraph is related to a method to determine two sets of Monte Carlo samples and the instant application is related to a method to determine only one set method of Monte Carlo samples. The method for demodulating data from a channel of copending application No. 11/063,633 as recited does not require to have limitation "(b) and (d)" to operate the demodulating method as recited above.

Therefore, claim 1 of the instant application merely broadens the scope of claim 1 of copending application No. 11/063,633 by eliminating the limitation "(b) and (d)". It is obvious the limitations of claim 1 of copending application No. 11/063,633 read on the limitations of claim 1 of the instant application.

Further, it has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same functions as before. See *In re Karlson*, 136 USPQ 184 (CCPA 1963). Also note *Ex parte Rainu*, 168 USPQ 375 (BdPatApp&Int 1970); omission of a reference element whose function is not needed would be obvious to one skilled in the art.

❑ Claim 13 of the instant application merely broadens the scope of claim 14 of copending application No. 11/063,633 by the same reason as addressed in the above paragraph. It is obvious the limitations of claim 14 of copending

application No. 11/063,633 read on the limitations of claim 13 of the instant

application.

❑ Claim 14 of the instant application merely broadens the scope of claim 1 of

copending application No. 11/063,633 by the same reason as addressed in the

above paragraph and in addition to the reason that claim 14 is a mean plus

function type claim related to claim 1 of the instant application. It is obvious the

limitations of claim 1 of copending application No. 11/063,633 read on the

limitations of claim 14 of the instant application. .

This is a <u>provisional</u> obviousness-type double patenting rejection because the

conflicting claims have not in fact been patented.

Allowable Subject Matter

7.   Claims 21 and 22 would be allowable if rewritten to overcome the objection(s) set

forth in this Office action.

8.   Claims 2, 4-8, 10-12, 16, 17 and 20 are objected to as being dependent upon an

objected claim, but would be allowable if rewritten in independent form including all of

the limitations of the base claim and any intervening claims.

9.   The following is an examiner's statement of reasons for allowance.

❑ The prior art fails to teach an apparatus of Claims 21 and 22 that

specifically comprises the following:

-- The instant application is deemed to be directed to a non-obvious

improvement over the admitted prior art of the instant application and the

PGPUB No. US 2002/0034261 and Yang et al. (A sequential Monte Carlo blind receiver for OFDM systems in frequency-selective fading channels. IEEE Trans. Sig. Proc., 50(2):271-280, February 2002.). The improvement comprises that

With regard claims 21 and 22, "(b1) calculating an exact expression for the probability distribution by enumerating m samples for less than all transmit antennas to obtain m data sequences, where m is a number of the deterministic Monte Carlo samples determined for the symbol interval; (b2) computing the importance weight $w_k^{(j)}$ for each symbol $s_k^{(i)}$, where k is an index identifying a transmit antenna; and (b3) selecting and preserving m distinct data sequences with the highest weights;" as recited in combination with other limitation as claimed.

Conclusion

10.   Reference US 2002/0034261 is cited because they are put pertinent to the OFDM demodulation with Monte Carlo simulation method. However, none of references teach detailed connection as recited in claim.

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2611

Ted M. Wang